

## **REMARKS**

This is a full and timely response to the Office Action of September 1, 2006.

Reconsideration and allowance of the application and all presently pending claims are respectfully requested.

Upon entry of this Response, claims 1-9 are pending in this application. Claims 1, 5, and 7 have been amended. Claim 17 is newly added. Claims 10-16 have been withdrawn by the Examiner. The prior art made of record has been considered, but is not believed to affect the patentability of the presently pending claims. Applicants believe that no new matter has been added by the amendments and that a new search is not necessary.

## **CLAIMS**

### **Claim 1**

Claim 1 is rejected under 35 U.S.C. §102(b) as purportedly being anticipated by Crawford. (U.S. Patent 6,936,212). Amended claim 1 reads as follows:

A method of producing a three-dimensional object, comprising the steps of:

(a) providing criteria about the three-dimensional object, the three-dimensional object is divided into complete layers and partial layers, the criteria indicate that after a specified number of complete layers are formed a partial layer is formed, the partial layer includes a shell layer and does not include an interior layer, and the complete layer includes the shell layer and the interior layer;

(b) forming a base layer, the base layer includes a shell layer and does not include an interior layer;

(c) planing the base layer;

(d) forming a complete layer according to the criteria;

(e) planing the complete layer;

(f) forming a partial layer according to the criteria;

(g) planing the partial layer; and

(h) repeating steps (d) through (g) until the three dimensional object is formed, ***wherein the interior layer forms a solid layer within the shell layer.***

(Emphasis added). Applicants traverse each of the §102 rejections in the Office Action and submit that the rejection of claim 1 under 35 U.S.C. §102 in view of Crawford should be withdrawn because Crawford does not disclose, teach, or suggest each and every feature of

claim 1 above. In this regard, Crawford does not disclose, teach, or suggest that “the interior layer forms a solid layer within the shell layer” as recited in claim 1. The Office Action refers to FIG. 4 of Crawford and the corresponding text to show that Crawford purportedly anticipates claim 1. However, Crawford includes an internal lattice structure 94, which the Office Action appears to be suggesting is the same as the interior layer of the claim 1. The internal lattice structure 94 includes voids 100 and is not a solid layer. Thus, Crawford does not form a solid layer within the shell layer as recited in claim 1. Thus, Crawford does not disclose, teach, or suggest, at least the limitations highlighted above in claim 1, and therefore, the rejection of claim 1 should be withdrawn.

#### **Claims 2-4**

Applicants respectfully submit that pending dependent claims 2-4 include every feature of independent claim 1. Thus, pending dependent claims 2-4 are also allowable. In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

Notwithstanding the arguments made above in reference to claim 1, the cited references do not teach “monitoring waste produced for each planing; and modifying the criteria if the waste produced is above a waste threshold” as recited in claim 2. The Office Action states that Crawford does not teach the features noted above as recited in claim 2. The Office Action asserts that Kerekes (U.S. Patent 6,492,651) monitoring of height constitutes waste monitoring. Monitoring waste has nothing to do with monitoring height. Waste is collected and monitored as each layer is planned. Monitoring waste is used to adjust the criteria for forming layers. For example, if the waste exceeds a waste threshold, the system forms a partial layer. Height monitoring is not a consideration and is unrelated to waste monitoring. Thus, Applicants traverse this assertion and if the rejection is not withdrawn Applicants request that the next Office Action provide support in the art that shows that height monitoring constitutes waste monitoring. Therefore, the rejection of claim 2 should be withdrawn.

## Claim 5

Claim 5 is rejected under 35 U.S.C. §103(a) as purportedly being obvious by Crawford in view of Kerekes. Amended claim 5 reads as follows:

A method of producing a three-dimensional object, comprising the steps of:  
providing criteria about the three-dimensional object, the three-dimensional object is divided into layers, the layers include a shell layer and an interior layer, the shell layer includes at least one shell voxel, the interior layer includes at least one interior voxel, the criteria indicate selected interior voxels of the at least one interior voxels to form for each layer, the criteria indicate a sequence in which to form each layer, and the selected interior voxels for each layer in the sequence include a different combination of interior voxels;  
forming a plurality of layers according to the criteria;  
planing at least one layer, ***wherein the interior layer forms a solid layer within the shell layer***, and  
forming the three-dimensional object.

(Emphasis added). Applicants traverse each of the §103 rejections in the Office Action and submit that the rejection of claim 5 under 35 U.S.C. §103 in view of Crawford and Kerekes should be withdrawn because Crawford and Kerekes, individually or in combination, do not disclose, teach, or suggest each and every feature of claim 5 above. In this regard, Crawford in view of Kerekes does not disclose, teach, or suggest that “the interior layer forms a solid layer within the shell layer” as recited in claim 5. The Office Action refers to FIG. 4 of Crawford and the corresponding text to show that Crawford purportedly anticipates claim 5. However, Crawford includes an internal lattice structure 94, which the Office Action appears to be suggesting is the same as the interior layer of the claim 5. The internal lattice structure 94 includes voids 100 and is not a solid layer. Thus, Crawford does not form a solid layer within the shell layer as recited in claim 5. Thus, Crawford in view of Kerekes does not disclose, teach, or suggest, at least the limitations highlighted above in claim 5, and therefore, the rejection of claim 5 should be withdrawn.

## Claims 6 and 17

Applicants respectfully submit that pending dependent claims 6 and 17 include every feature of independent claim 5. Thus, pending dependent claims 6 and 17 are also allowable. In re Fine.

## Claim 7

Claim 7 is rejected under 35 U.S.C. §103(a) as purportedly being obvious by Crawford in view of Kerekes. Amended claim 7 reads as follows:

A method of producing a three-dimensional object, comprising the steps of:

providing a criteria for forming the three-dimensional object, the three-dimensional object includes a plurality of layers, each layer includes layers selected from a shell layer and an interior layer, the shell layer includes at least one shell voxel, and the interior layer includes at least one interior voxel;

forming and planing the layers in an iterative manner using the criteria provided, ***wherein the interior layer forms a solid layer within the shell layer,***

***monitoring waste produced for each planing;***

***modifying the criteria if the waste produced is above a waste threshold;***

controlling an amount of waste produced by using the criteria provided; and

forming the three-dimensional object.

(Emphasis added). Applicants traverse each of the §103 rejections in the Office Action and submit that the rejection of claim 7 under 35 U.S.C. §103 in view of Crawford and Kerekes should be withdrawn because Crawford and Kerekes, individually or in combination, do not disclose, teach, or suggest each and every feature of claim 7 above. In this regard, Crawford in view of Kerekes does not disclose, teach, or suggest that “the interior layer forms a solid layer within the shell layer” as recited in claim 7. The Office Action refers to FIG. 4 of Crawford and the corresponding text to show that Crawford purportedly anticipates claim 7. However, Crawford includes an internal lattice structure 94, which the Office Action appears to be suggesting is the same as the interior layer of the claim 7. The internal lattice structure 94

includes voids 100 and is not a solid layer. Thus, Crawford does not form a solid layer within the shell layer as recited in claim 7.

In addition, the Office Action asserts that Kerekes (U.S. Patent 6,492,651) monitoring of height constitutes waste monitoring. Monitoring waste has nothing to do with monitoring height. Waste is collected and monitored as each layer is planned. Monitoring waste is used to adjust the criteria for forming layers. For example, if the waste exceeds a waste threshold, the system forms a partial layer. Height monitoring is not a consideration and is unrelated to waste monitoring. Thus, Applicants traverse this assertion and if the rejection is not withdrawn Applicants request that the next Office Action provide support in the art that shows that height monitoring constitutes waste monitoring.

Thus, Crawford in view of Kerekes does not disclose, teach, or suggest, at least the limitations highlighted above in claim 7, and therefore, the rejection of claim 7 should be withdrawn.

#### **Claims 8 and 9**

Applicants respectfully submit that pending dependent claims 8 and 9 include every feature of independent claim 7. Thus, pending dependent claims 8 and 9 are also allowable. In re Fine.

### **CONCLUSION**

In light of the foregoing amendments and for at least the reasons set forth above, Applicants respectfully submit that all objections and/or rejections have been traversed, rendered moot, and/or accommodated. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested.

In addition, any other statements in the Office Action that are not explicitly addressed herein are not intended to be admitted. In addition, any and all findings of inherency are traversed as not having been shown to be necessarily present. Furthermore, any and all findings of well-known art and official notice, or statements interpreted similarly, should not be considered well known since the Office Action does not include specific factual findings predicated on sound technical and scientific reasoning to support such conclusions.

If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'CBL', is written over a horizontal line.

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## CERTIFICATE OF MAILING

I hereby certify that the below listed items are being deposited with the U.S. Postal Service as first class mail in an envelope addressed to:

**Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450**

on 11/21/06

Sara Rogers  
Sara A. Rogers

In Re Application of:

Nielsen, et al.

Serial No.: 10/691,761

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Group Art Unit: 1732

Examiner: Lawrence Emile Lambelet

Docket No. HP: 200309747-1  
TKHR: 050834-1220

For: SYSTEMS AND METHODS FOR REDUCING WASTE IN SOLID FREEFORM  
FABRICATION

The following is a list of documents enclosed:

Return Postcard  
Amendment  
Amendment Transmittal Sheet